



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2002AK7B

Title: Luminescent Bacteria: A New Water Quality Issue?

Project Type: Research

Focus Categories: Water Quality

Keywords: Luminescent, bacteria, salmon, freshwater, Yukon River, Alaska

Start Date: 03/01/2002

End Date: 02/28/2003

Federal Funds Requested: \$13,563

Non-Federal Matching Funds Requested: \$23,942

Congressional District: Alaska

Principal Investigator:

Joan F. Braddock

University of Alaska, Fairbanks

Abstract

Subsistence fishers from several native villages (e.g., Holy Cross) expressed concern this past summer over consuming fish when they observed fish on their drying racks "glowing in the dark" (see Fairbanks Daily News-Miner, August 27, 2001, page 1). The phenomenon is caused by growth of luminescent bacteria, common in the marine environment, but generally not found in freshwater environments. Luminescent bacteria are generally considered to be non-pathogenic. However, the widespread presence of these bacteria in summer 2001 indicates conditions favoring growth of these organisms and potentially other harmful bacteria. In general, it is likely prudent for fishers not to eat fish heavily contaminated with luminescent bacterial growth. Fortunately, we have been working on identifying and characterizing a set of luminescent bacterial isolates from the Yukon River: one obtained in 1997 from a chum salmon harvested near Eagle, Alaska and several others obtained from chum, silver, and king salmon in summer 2001. However, this work has been very limited because we have not previously had funding to work on our isolates. Prior to this summer, the luminescent bacteria found on Yukon River salmon were an interesting microbiological problem but not a water quality concern in Alaska. We have received a small amount of support for the spring 2002 semester to begin this project but need additional funding to continue this project. The funding requested here will exclusively support a master's student. The overall objective of this study is to characterize luminescent bacteria isolated from salmon harvested for subsistence use on the Yukon River. We will also sample various locations on the Yukon River and river water itself to attempt to determine the distribution of luminescent bacteria in this freshwater environment. The results will be of basic scientific interest, as luminescent bacteria have not been well documented in freshwater, and of applied interest to regulators responsible for providing advice to fishers.